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1999 AGRICULTURAL CHEMICAL USAGE

This is the tenth annual Field Crops Summary issued by NASS containing on-farm agricultural chemical use statistics. The data presented are part of the data series on chemical use funded through the Water Quality Initiative. The Water Quality Initiative is a multi-agency program designed to provide information for farmers, ranchers, and foresters to address on-farm and off-farm environmental issues. In the past, there has been an inadequate amount of farm level data to determine the magnitude of water quality problems or to permit an assessment of alternatives for farmers and other affected parties. This report and other agricultural chemical reports help fill the needs of analysts evaluating the complex environmental issues of the 2000's.

CORN

Nitrogen was applied to 98% of the total 1999 corn acreage in the 15 States surveyed. All of the surveyed States had 92% or more of their acreage treated with nitrogen. Growers used an average of 1.7 applications per acre while applying an average 77 pounds of nitrogen per treatment. In the States surveyed, 82% of the planted corn acreage received phosphate fertilizer. Potash fertilizer was applied to 67 percent of the acreage.

Herbicides were applied to 98% of the total corn acreage in the survey, while insecticides were used on 30% of the acreage. Atrazine was the most used herbicide with 70% of the reported acreage being treated. Atrazine was applied at the rate of 1.02 pounds per acre. Metolachlor and Acetochlor were the next two most widely used herbicides and were applied to 29% and 27% of the reported acreage, respectively. Chlorpyrifos and Terbufos were the most commonly used insecticides, representing 7.5 million out of the total 10.1 million pounds applied in the 15 States surveyed. Chlorpyrifos was applied at the rate of 1.08 pounds per acre and Terbufos was applied at 1.09 pounds per acre.

In Nebraska, nitrogen was applied to 99% of the acreage, phosphates to 75% and potash to 18%. Herbicides were applied to 99% of the corn acreage while insecticides covered 39%. There were 207 usable reports. In the U.S. the 15 states surveyed accounted for 88.0% of the corn acres planted in 1999.

Corn: Acreage--Percent Receiving Chemicals, Number of Applications, Rate per Application, 1999

State	Area Planted	Nitrogen			Phosphate			Potash			Herbicide	Insecticide
		Area 1/ Applied	Applications	Rate Per Application	Area 1/ Applied	Applications	Rate Per Application	Area 1/ Applied	Applications	Rate Per Application	Area Applied	Area Applied
	1,000 Acres	Percent	Number	Pounds	Percent	Number	Pounds	Percent	Number	Pounds	Percent	Percent
Iowa	12,100	98	1.4	87	75	1.0	61	75	1.0	77	99	25
Minnesota	7,100	92	1.5	71	90	1.0	46	86	1.0	50	98	11
Missouri	2,650	100	1.4	110	84	1.1	55	84	1.0	73	98	38
Nebraska	8,600	99	1.9	68	75	1.0	35	18	1.0	14	99	39
So. Dak.	3,600	98	1.5	60	88	1.1	37	49	1.0	24	95	18
Total 2/	68,300	98	1.7	77	82	1.0	50	67	1.0	74	98	30

1/ Refers to acres reported as receiving one or more applications of a specific fertilizer ingredient. 2/ States surveyed were CO, IL, IN, IA, KS, KY, MI, MN, MO, NE, NC, OH, SD, TX, WI.

Corn: Frequency and Extent of Pesticide Usage By Active Ingredient, Nebraska, 1998-1999

Agricultural Chemical 1/	Area Applied 2/		Applications		Rate per Application		Rate per Crop Year		Total Applied	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
	Percent		Number		Pounds per acre				1,000 pounds	
Herbicides:										
2,4-D	10	6	1.2	1.0	0.51	0.28	0.64	0.28	553	144
Acetochlor	18	20	1.0	1.0	2.04	1.56	2.04	1.56	3,239	2,655
Alachlor	11	9	1.0	1.0	1.56	2.09	1.56	2.09	1,462	1,550
Atrazine	63	87	1.0	1.0	0.93	1.01	0.98	1.10	5,382	8,286
Bromoxynil	3	1	1.0	1.0	0.29	0.25	0.29	0.25	72	27
Clopyralid	7	3	1.0	1.0	0.07	0.12	0.07	0.12	43	32
Cyanazine	6	9	1.0	1.0	1.13	1.41	1.21	1.41	606	1,123
Dicamba	8	8	1.0	1.0	0.21	0.27	0.21	0.27	142	186
Diacamba, Dimet. salt	---	2	---	1.0	---	2.29	---	2.29	---	347
Dicamba, Pot.salt	---	4	---	1.0	---	0.31	---	0.31	---	113
Diflufenzopyr-Sodium	---	2	---	1.0	---	0.91	---	0.91	---	139
Dimethenamid	2	3	1.0	1.0	1.60	1.34	1.60	1.34	315	322
Flumetsulam	7	4	1.0	1.0	0.03	0.04	0.03	0.04	16	14
Glyphosate	5	5	1.0	1.3	0.64	0.65	0.64	0.87	298	410
Halosulfuron	6	8	1.0	1.0	0.04	0.09	0.04	0.09	18	60
Imazethapyr	2	---	1.0	---	0.02	---	0.02	---	3	---
Isoxaflute	---	7	---	1.0	---	0.08	---	0.08	---	43
Metolachlor	47	39	1.0	1.0	1.59	1.10	1.68	1.17	6,928	3,926
Nicosulfuron	3	13	1.0	1.0	0.03	0.01	0.03	0.01	9	13
Pendimethalin	2	---	1.0	---	0.49	---	0.49	—	74	---
Primisulfuron	3	6	1.0	1.0	0.02	0.03	0.02	0.03	6	15
Prosulfuron	3	6	1.0	1.0	0.02	0.01	0.02	0.01	5	5
Rimsulfuron	---	13	---	1.0	---	0.01	---	0.01	---	11
Insecticides:										
Chlorpyrifos	5	4	1.0	1.0	0.67	1.09	0.67	1.09	317	345
Cyfluthrin	12	4	1.0	1.0	0.006	0.006	0.006	0.006	7	2
Fipronil	---	3	---	1.0	---	0.12	---	0.12	---	32
Methyl parathion	3	5	1.1	1.1	0.31	0.51	0.34	0.56	84	266
Permethrin	3	5	1.0	1.8	0.07	0.06	0.07	0.11	20	44
Tebupirimphos	12	4	1.0	1.0	0.12	0.12	0.12	0.12	129	41
Tefluthrin	8	11	1.0	1.0	0.10	0.08	0.10	0.08	68	79
Terbufos	9	4	1.0	1.0	1.10	1.12	1.15	1.12	926	392

1/ Insufficient reports to publish data for the following agricultural chemicals: Herbicides: Acetamide, Bentazon, EPTC, Glufosinate-ammonium, Imazapyr, Metribuzin, Pyridate, Thifensulfuron. Insecticides: Bifenthrin, Bt (Bacillus thur.), Carbofuran, Chlorethozyfos, Ethyl parathion, Lambda-cyhalothrin, Phorate. 2/ Refers to acres reported as receiving one or more applications of a specific agricultural chemical.

SOYBEANS

Soybean producers in the 17 States surveyed applied nitrogen fertilizer to 18% of the area planted to soybeans. The percent of acres treated ranged from 5% in Louisiana to 54% in North Carolina. The average number of nitrogen applications per acre was 1.0 with an average application rate of 20 pounds per acre. Phosphate was applied on 26% of the soybean planted acreage in the surveyed States. Producers in North Carolina applied phosphate to 71% of the soybean acreage, while Minnesota applications covered only 13% of the soybean acreage. Potash was applied to 28% of the planted soybean acreage.

In the 17 States surveyed, 96% of the soybean acreage was treated with herbicides. The most widely used herbicides were Glyphosate, applied to 62% of the soybean acres, followed by Imazethapyr applied to 16% of the acreage, Pendimethalin and Trifluralin were both applied to 14% of the soybean acreage. Growers in the surveyed states applied insecticide to only 2% of the total soybean acres planted. With the exception of insecticide applications in Arkansas, Illinois, Kansas, Louisiana, Mississippi, North Carolina, Ohio, Pennsylvania, and Tennessee there were too few reports to publish individual state data for insecticides. Growers reported few fungicide or other chemical applications.

In Nebraska, nitrogen was applied to 25% of the soybean acreage, phosphates to 25%, and potash to 16%. Herbicides were applied to 96% of the soybean acreage while insecticides were not reported as being applied. There were 175 usable reports. In the U.S., 17 states surveyed in 1999 covered 92% of the soybean acreage planted.

Soybeans: Acreage--Percent Receiving Chemicals, Number of Applications, Rate per Application, 1999

State	Area Planted	Nitrogen			Phosphate			Potash			Herbicide
		Area 1/ Applied	Applications	Rate Per Application	Area 1/ Applied	Applications	Rate Per Application	Area 1/ Applied	Applications	Rate Per Application	Area Applied
	1,000 Acres	Percent	Number	Pounds	Percent	Number	Pounds	Percent	Number	Pounds	Percent
Iowa	10,800	7	1.1	27	17	1.0	55	22	1.0	72	99
Minnesota	7,000	13	1.0	20	13	1.0	33	13	1.0	58	97
Missouri	5,400	15	1.0	15	23	1.0	45	23	1.0	70	97
Nebraska	4,300	25	1.1	15	25	1.0	29	16	1.0	23	96
Total 2/	67,840	18	1.0	20	26	1.0	46	28	1.0	78	96

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient. 2/ States surveyed: AR, IL, IN, IA, KS, KY, LA, MI, MN, MS, MO, NE, NC, OH, PA, SD, TN.

Soybeans: Frequency and Extent of Herbicide Usage By Active Ingredient, Nebraska, 1998-1999

Agricultural Chemical 1/	Area Applied 2/		Applications		Rate per Application		Rate per Year		Total Applied	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
	Percent		Number		Pounds per acre				1,000 pounds	
2,4-D	7	---	1.0	---	0.42	---	0.42	---	111	---
Acifluorfen	---	2	---	1.0	---	0.19	---	0.19	---	16
Alachlor	5	6	1.1	1.0	1.21	1.40	1.38	1.40	267	346
Chlorimuron-ethyl	7	2	1.0	1.0	0.01	0.01	0.01	0.01	3	1
Clomazone	5	2	1.0	1.0	0.35	0.56	0.35	0.56	67	47
Flumetsulam	4	---	1.0	---	0.06	---	0.06	---	9	---
Glyphosate	59	70	1.2	1.1	0.65	0.72	0.83	0.85	1,852	2,559
Imazamox	2	---	1.0	---	0.04	---	0.04	---	2	---
Imazaquin	---	2	---	1.0	---	0.06	---	0.06	---	4
Imazethapyr	16	26	1.0	1.0	0.04	0.05	0.04	0.05	25	51
Metolachlor	7	---	1.0	---	1.08	---	1.08	---	286	---
Metribuzin	4	7	1.0	1.0	0.16	0.18	0.16	0.18	25	51
Pendimethalin	14	29	1.0	1.1	0.80	0.72	0.81	0.79	438	974
Quizalofop-ethyl	1	---	1.0	---	0.05	---	0.05	---	2	---
Sulfenthrazone	2	---	1.0	---	0.12	---	0.12	---	10	---
Thifensulfuron	2	---	1.0	---	0.003	---	0.003	---	3/	---
Trifluralin	26	11	1.0	1.0	1.02	0.67	1.03	0.67	1,017	326

1/ Insufficient reports to publish data for the following agricultural chemicals. Herbicides: Acetamide, Atrazine, Bentazon, Bromoxynil, Clethodim, Cloransulam-methyl, Dimethenamid, Fenoxaprop, Fluazifop-P-butyl, Flumiclorac-Pentyl, Fomesafen, Lactofen, Sethoxydim, Sulfosate. 2/ Refers to acres receiving one or more applications of a specific agricultural chemical. 3/ Total applied is less than 1,000 pounds.

***TERMS AND DEFINITIONS**: Agricultural chemicals refer to ingredients in both fertilizer and pesticide products. Fertilizer, in this report, refers to applications of nitrogen, phosphate, and potash. Pesticides include any substances or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. Pests targeted by pesticides include weeds, insects, fungi, and other forms of life. Herbicides, insecticides, fungicides, and other chemicals make up the four classes of pesticides presented in this report. Miticides and nematicides are included as insecticides. Soil fumigants, growth regulators, defoliants, and desiccants are included as other chemicals. This report excludes pesticides used for seed treatments, post-harvest applications to the commodity, and spot treatments.*

***DATA RELIABILITY**: The probability nature of the survey provides expansion of data so that the estimates are statistically representative of chemical use on the targeted crops in the surveyed States. A complete census may have yielded different results. The reliability of these survey results are affected by sampling variability and non-sampling errors. Sampling variability of the estimates differed considerably by chemical and crop. In general, the more often the chemical was applied, the smaller the sampling variability.*

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